I CLAIM:

1. A liquid source chemical vaporizer for vaporizing liquid source chemical and delivering vapor phase chemical, comprising:

a container configured to hold liquid source chemical up to a liquid fill level and to additionally define an inner gas volume;

a carrier gas inlet communicating carrier gas into the container;

a gas outlet communicating with the inner gas volume of the container; and

a porous element positioned to be in contact with liquid source chemical and in contact with the inner gas volume within the container.

2. The source chemical vaporizer of Claim 1, wherein the porous element comprises a porous gas flow divider at least partially defining a gas flow path from the carrier gas inlet to the gas outlet.

3. The source chemical vaporizer of Claim 2, wherein a porosity of the gas flow divider is selected to cause liquid chemical to migrate along the flow divider by capillary action.

4. The source chemical vaporizer of Claim 3, wherein each of the carrier gas inlet and the gas outlet is arranged to open to the inner gas volume above the liquid fill level.

5. The source chemical vaporizer of Claim 4, wherein the gas flow divider comprises a spiral wall extending from a bottom of the container to a ceiling of the container, wherein one of the carrier gas inlet and the gas outlet is positioned approximately at a center of the spiral and the other of the carrier gas inlet and the gas outlet is positioned approximately at an outer end of the spiral.

6. The source chemical vaporizer of Claim 4, wherein the gas flow divider comprises a plurality of concentric inner containers extending from a bottom of the container to a ceiling of the container and having a plurality of openings therein to define a tortuous path from the carrier gas inlet to the gas outlet above the liquid fill level.

7. The source chemical vaporizer of Claim 6, wherein the openings of adjacent inner containers are on opposite sides from one another.

8. The source chemical vaporizer of Claim 2, wherein the gas flow divider is configured to allow vapor phase reactant to pass through while preventing liquid phase reactant from passing through.

9. The source chemical vaporizer of Claim 8, wherein the gas flow divider comprises a semi-porous membrane defining a tube extending from the carrier gas inlet to the gas outlet, the tube sized and shaped to extend through the liquid source chemical and collect vapor phase reactant through the membrane.

10. The source chemical vaporizer of Claim 8, wherein the gas flow divider comprises a semi-porous membrane separating an inner compartment from the liquid source chemical in the container, the inner compartment defining the inner gas volume.

11. The source chemical vaporizer of Claim 10, wherein the inner compartment includes a tortuous gas path from the carrier gas inlet to the gas outlet, the gas flow path within the inner compartment being in communication with the semi-porous membrane.

12. The source chemical vaporizer of Claim 11, wherein the inner compartment is formed at a bottom end of the outer container.

13. The source chemical vaporizer of Claim 11, wherein the tortuous path is defined by plurality of concentric containers having openings therebetween.

14. The source chemical vaporizer of Claim 11, wherein the tortuous path is defined by a plurality of baffle walls extending from the membrane to a floor of the container, the membrane being supported by a perforated plate.

15. The source chemical vaporizer of Claim 1, wherein the carrier gas inlet comprises a bubbler tube extending through the inner gas volume into the liquid source chemical, the porous element being the bubbler tube, whereby the inner gas volume is above the liquid fill level and communicates gas through pores in the bubbler tube.

16. The source chemical vaporizer of Claim 15, wherein pores in the bubbler tube are sized to produce a flow rate to the inner gas space above the liquid fill level, under normal operation, of less than about 50 % of a flow rate of carrier gas through a bottom of the bubbler tube producing bubbles within the liquid source chemical.

17. The source chemical vaporizer of Claim 15, further comprising:

a carrier gas tube outside of the container in fluid communication with the bubbler tube; and

a capillary tube communicating with the carrier gas tube outside of the container and communicating directly with the inner gas volume within the container.

18. The source chemical vaporizer of Claim 17, wherein the bubbler tube and the carrier gas tube are configured to produce a total gas flow rate through the capillary tube and the pores of the bubbler tube directly to the inner gas space above the liquid fill level, under normal operation, of less than about 10% of a carrier gas flow rate through a bottom of the bubbler tube creating bubbles within the liquid source chemical.

19. The source chemical vaporizer of Claim 15, further comprising an elastic liner within the bubbler tube, the elastic liner configured to collapse and prevent liquid flow therethrough when the inner gas volume has a higher pressure than the carrier gas inlet.

20. A liquid source chemical vaporizer, comprising:

an outer container configured to hold liquid source chemical;

a carrier gas inlet communicating with an inner gas volume defined within the outer container;

a gas mixture outlet communicating with the inner gas volume; and

at least one flow divider defining a gas flow path through the inner gas volume.

21. The source chemical vaporizer of Claim 20, wherein the at least one flow divider comprises a material selected for causing liquid chemical to wet the flow divider by capillary action.

22. The source chemical vaporizer of Claim 20, wherein the material of the at least one flow divider is microporous.

23. The source chemical vaporizer of Claim 22, wherein the flow divider extends a height of the outer container from an outer container floor to an outer container ceiling.

24. The source chemical vaporizer of Claim 23, wherein the flow divider has a spiral shape, and one of the gas inlet and gas outlet communicates with the inner gas volume overlying liquid source chemical proximate a center of the spiral, while the other of the gas

inlet and the gas outlet communicates with the inner gas volume proximate an outer edge of the spiral flow divider.

25. The source chemical vaporizer of Claim 23, wherein the at least one flow divider comprises a plurality of inner containers within one another, the containers each having an opening permitting gas flow from the carrier gas inlet to the outlet along the gas flow path through the plurality of containers.

26. The source chemical vaporizer of Claim 25, wherein the opening of each container is on an opposite side from the opening of an adjacent container.

27. The source chemical vaporizer of Claim 23, wherein the material has a porosity between about 30% and 70%.

28. The source chemical vaporizer of Claim 20, wherein the at least one flow divider comprises a semi-porous, breathable membrane in contact with each of the gas flow path and the liquid source chemical.

29. The source chemical vaporizer of Claim 28, wherein the membrane defines the gas flow path within a tube extending from the carrier gas inlet to the gas mixture outlet.

30. The source chemical vaporizer of Claim 28, wherein the membrane at least partially separates an inner compartment from the liquid source chemical, the gas flow path being defined within the inner compartment comprising.

31. The source chemical vaporizer of Claim 30, wherein the inner compartment is formed at a bottom of the outer container, the membrane being formed as a ceiling to the inner compartment below liquid source chemical.

32. The source chemical vaporizer of Claim 30, wherein the flow divider comprises a spiral shape extending from a first wall of the inner compartment to a second wall of the inner compartment, wherein the second wall of the inner compartment comprises a perforated plate attached to the semi-porous membrane.

33. A liquid source bubbler system, comprising:

a container configured to hold liquid source chemicals;

a bubbler tube communicating with an inert gas source, the bubbler tube extending into an opening within a liquid storage space;

a gas outlet communicating with an inner gas space defined within the container above the liquid storage space; and

a by-pass conductance route, configured to release excess gas pressure from within the inner gas space to the gas inlet, thereby inhibiting liquid flow up the bubbler tube.

34. The system of Claim 33, wherein the by-pass conductance path comprises a plurality of openings in a wall of the bubbler tube, at least some of the openings opening from the bubbler tube to the inner gas space.

35. The system of Claim 34, further comprising an elastic liner within the bubbler tube, configured to collapse on excess pressure within the inner gas space relative to the gas inlet.

36. The system of Claim 34, further comprising a capillary tube communicating with the gas inlet outside of the source chemical container and communicating with the inner gas volume within the container.

37. The system of Claim 33, wherein the bubbler tube defines a volume greater than about 15% of the volume within the source chemical container.

38. The system of Claim 37, wherein the volume of the bubbler tube defines an inner volume greater than about 40% of the volume of the source container.

39. The system of Claim 33, wherein the bubbler tube defines a horizontal cross-sectional surface area greater than about 40% of a horizontal cross sectional surface area of the source container.

40. The system of Claim 33, wherein a volume of liquid between a full liquid level and the bottom of the leveler tube is less than a volume within the bubbler tube.

41. The system of Claim 40, wherein the opening at the bottom of the bubbler tube has a narrower horizontal cross-sectional surface area than the horizontal cross-sectional surface area of the bubbler tube.

42. The system of Claim 41, wherein the opening at the bottom of the bubbler tube represents less than about 10% of the horizontal cross-sectional surface area of the bubbler tube.